

The ARRIVE Essential 10

These items are the basic minimum to include in a manuscript. Without this information, readers and reviewers cannot assess the reliability of the findings.

Item	Recommendation	Section/line number, or reason for not reporting
Study design	1 For each experiment, provide brief details of study design including: - The groups being compared, including control groups. If no control group has been used, the rationale should be stated. - The experimental unit (e.g. a single animal, litter, or cage of animals).	The experimental design of this study is as follows: (1) Sr intervention experiments: Establish a normal control group, a tibial dysplasia model group, and Sr intervention groups at different doses based on the model. Pathological phenotypes were observed to assess the model group. Each experimental unit consists of a single animal, whose tissue samples or measurement data serve as independent observations for statistical analysis.
Sample size	2 - Specify the exact number of experimental units allocated to each group, and the total number in each experiment. Also indicate the total number of animals used. - Explain how the sample size was decided. Provide details of any <i>a priori</i> sample size calculation, if done.	This study utilized a total of 320 experimental animals, allocated as follows: In the strontium intervention experiment, a normal control group, a TD model group, and TD+Sr100/200/400 groups were used. The sample size for each group in this study was carefully determined to balance scientific rigor with animal ethics principles, while ensuring statistical stability and maximization for statistical power. The final
Inclusion and exclusion criteria	3 - Describe any criteria used for including and excluding animals (or experimental units) during the experiment, and data points during the analysis. Specify if these criteria were established <i>a priori</i>. If no criteria were set, state this explicitly. - For each experimental group, report any animals, experimental units or data points not included in the analysis and explain why. If there were no exclusions, state so. - For each analysis, report the exact value of <i>n</i> in each experimental group.	All animal inclusion and exclusion criteria, as well as data processing principles, were predefined (<i>a priori</i>) for this study: animals were included if healthy and within the specified initial weight range; animals in the To ensure sufficient statistical power, the actual number of animals used in this study slightly exceeded the minimum requirement based on statistical efficacy calculations. The exact sample sizes for each group ultimately used in statistical analysis were as follows: In the broiler chicken strontium intervention experiment, the normal control
Randomisation	4 - State whether randomisation was used to allocate experimental units to control and treatment groups. If done, provide the method used to generate the randomisation sequence. - Describe the strategy used to minimise potential confounders such as the order of treatments and measurements, or animal/cage location. If confounders were not controlled, state this explicitly.	Prior to the experiment, all animals were sorted and numbered according to body weight before being completely randomized into experimental groups. Post-randomization verification confirmed no significant differences in initial body weight among groups, validating the randomization To systematically control potential confounding factors, this study employed multiple strategies throughout the experiment: animals were grouped using randomized sequences; housing cages were rotated periodically during the experiment to
Blinding	5 Describe who was aware of the group allocation at the different stages of the experiment (during the allocation, the conduct of the experiment, the outcome assessment, and the data analysis).	Strict hierarchical control over knowledge of group assignments was implemented at different stages of the experiment: Randomization was performed exclusively by personnel not involved in subsequent experimental procedures; Animal care and dosing personnel required knowledge of
Outcome measures	6 - Clearly define all outcome measures assessed (e.g. cell death, molecular markers, or behavioural changes). - For hypothesis-testing studies, specify the primary outcome measure, i.e. the outcome measure that was used to determine the sample size.	The indicators evaluated in this study are clearly defined as follows: (1) Macroscopic and microstructural bone parameters: Including tibial weight, length, diameter, and area. (2) Modified bone volume fraction. In this hypothesis testing study, the primary outcome measures used for prior sample size calculations were as follows: for the broiler TD and strontium intervention experiments: normal tibial growth rate
Statistical methods	7 - Provide details of the statistical methods used for each analysis, including software used. - Describe any methods used to assess whether the data met the assumptions of the statistical approach, and what was done if the assumptions were not met.	The data were statistically analyzed via SPSS 26.0 (SPSS Inc., USA) and GraphPad Prism 8.0.2 (GraphPad Software, USA). After confirming the normality of the data by the Shapiro-Wilk test, comparisons between This study rigorously evaluates whether data satisfy the assumptions of the statistical methods employed, following this specific procedure: First, Shapiro-Wilk tests are conducted on all continuous data sets to
Experimental animals	8 - Provide species-appropriate details of the animals used, including species, strain and substrain, sex, age or developmental stage, and, if relevant, weight. - Provide further relevant information on the provenance of animals, health/immune status, genetic modification status, genotype, and any previous procedures.	One-day-old male Arbor Acres (AA) broilers (initial body weight: 47.82 ± 5.35 g) were obtained from Xingda Poultry Industry Co., Ltd. (Kaifeng, Henan, China). For the fecal microbiota trial, all male All animals used in this study were procured from qualified suppliers holding valid laboratory animal production licenses (broiler chickens sourced from Xingda Poultry Industry Co., Ltd. Kaifeng, Henan)
Experimental procedures	9 For each experimental group, including controls, describe the procedures in enough detail to allow others to replicate them, including: - What was done, how it was done and what was used. - When and how often. - Where (including detail of any acclimatisation periods). - Why (provide rationale for procedures).	In the Sr intervention trial, broilers were housed under controlled environmental conditions: a 12 h:12 h light–dark cycle, ambient temperature maintained within the For the broiler chicken TD and strontium intervention experiments, the trials lasted 14 days; For the broiler chicken RA toxicity experiments, the trials lasted 21 days: For No abnormalities. This study conducted three animal experiments, with all procedures adhering to the principles of randomization and blinding. Broiler chicken experiments: 1. The TD
Results	10 For each experiment conducted, including independent replications, report: - Summary/descriptive statistics for each experimental group, with a measure of variability where applicable (e.g. mean and SD, or median and range). - If applicable, the effect size with a confidence interval.	The key findings from the three core experiments in this study are summarized as follows (all data expressed as mean ± standard deviation): In the broiler TD model, the TD group exhibited significantly lower For all major intergroup comparisons in this study, effect sizes and 95% confidence intervals were calculated to assess the biological significance of the differences.